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**DESCRIPTION OF A NEW SPECIES OF *TELESTO* FROM THE
INLAND SEA OF JAPAN, WITH A REVIEW OF THE
TELESTACEAN OCTOCORALS^{1,2)}**

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With 1 Text-figure and Plate I

Abstract

A new shallow-water telestid, *Telesto setoutiana* sp. nov. from the Inland Sea of Japan (Seto Naikai) is described. In addition, all of the known species of the Telestacean octocorals are reviewed, proposing an emended system of classification of the order Telestacea.

Introduction

In the autumn of 1963, I made collecting trips to various places surrounding the Inland Sea of Japan (Seto Naikai) from October 23 to November 17. During the trips I noticed the occurrence of an unknown species of telestid octocorals rather commonly in shallow waters where I visited and while examining the invertebrate collections deposited in various institutions visited and also alive there.

This study was aided in part by a grant from the Ministry of Education for scientific researches (G-4064 in 1962). I am deeply indebted to Dr. A. INABA and Mr. T. HOSHINO of the Mukaishima Marine Biological Station (Hiroshima University), to Dr. M. YOSHIDA and Dr. T. YAMASU of the Tamano Marine Laboratory (Okayama University), and to Dr. T. ITO and Mr. K. NIKAIÐÔ of the Biological Institute of Ehime University at Matuyama for giving me laboratory facilities and rendering sufficient living material for the study. Besides, particularly to Dr. Sh. FUSE of our Laboratory I am indebted for collecting additional material at Mukaisima, Hiroshima-ken and making excellent photographs which form the nucleus of this paper.

My special thanks are also due to Dr. Frederick M. BAYER, then of the United States National Museum, Washington, D. C. for his kindness rendering some of the representative West Atlantic material such as *Telesto riisei* (DUCH. et MICH.), *T. fruticulosa* DANA, *T. flavula* DEICHMANN and *T. sanguinea* DEICHMANN for comparative study some years ago.

1) Contributions from the Seto Marine Biological Laboratory, No. 571.

2) Contributions from the Mukaishima Marine Biological Station, No. 108.

Description of a New Species of *Telesto* from the Inland Sea

Depositories of the examined specimens are abbreviated as follows:

Seto Marine Biological Laboratory, Sirahama	SMBL
Mukaishima Marine Biological Station, Mukaisima	MMBS
Biological Institute, Ehime University, Matuyama	BIEU
Tamano Marine Laboratory, Sibukawa, Tamano	TML
Osaka Museum of Natural History, Osaka	OMNH

Telesto setoutiana UTINOMI, sp. nov.

(Japanese name: Setouti-koeda, n. n.)

Material examined.

- Holotype. Cape Kannon-bana, Island Mukaisima, Hiroshima-Ken, 5-XI-1971, T. HOSHINO coll. (SMBL, Type 238).
 Paratype A. Cape Kannon-bana, Island Mukaisima, Hiroshima-Ken, 5-XI-1971, T. HOSHINO coll. (MMBS).
 Paratype B. Siraisi, a rocky reef east of Mukaisima, Hiroshima-Ken, 27-VIII-1969, Sh. FUSE coll. (SMBL, Type 242).
 Paratype C. Cape Kannon-bana, Island Mukaisima, Hiroshima-Ken, 26-VIII-1961, Y. SHIBATA coll. (OMNH, Coe. 1).
 Paratype D. Onomiti Pier, Onomiti-suidô, 27-X-1950, A. INABA coll. (SMBL, Type 243).
 Paratype E. Kannon-bana, Mukaisima, growing on the wall of a barnacle *Balanus tintinnabulum volcano* PILS., 5-XI-1971, T. HOSHINO coll. (MMBS).
 Paratype F. Kozuti-zima, an island in Bisan-seto, Okayama-Ken, VII-1964, T. YAMASU coll. (TML, SMBL).
 Paratype G. Usa-zima, an island off Sakaide, Kagawa-Ken, X-1963, T. YAMASU coll. (TML, SMBL).
 Reference spec. Island Ka-sima, in Uwa-kai, Ehime-Ken, 17-III-1966, K. NIKAIIDô coll. (BIEU).

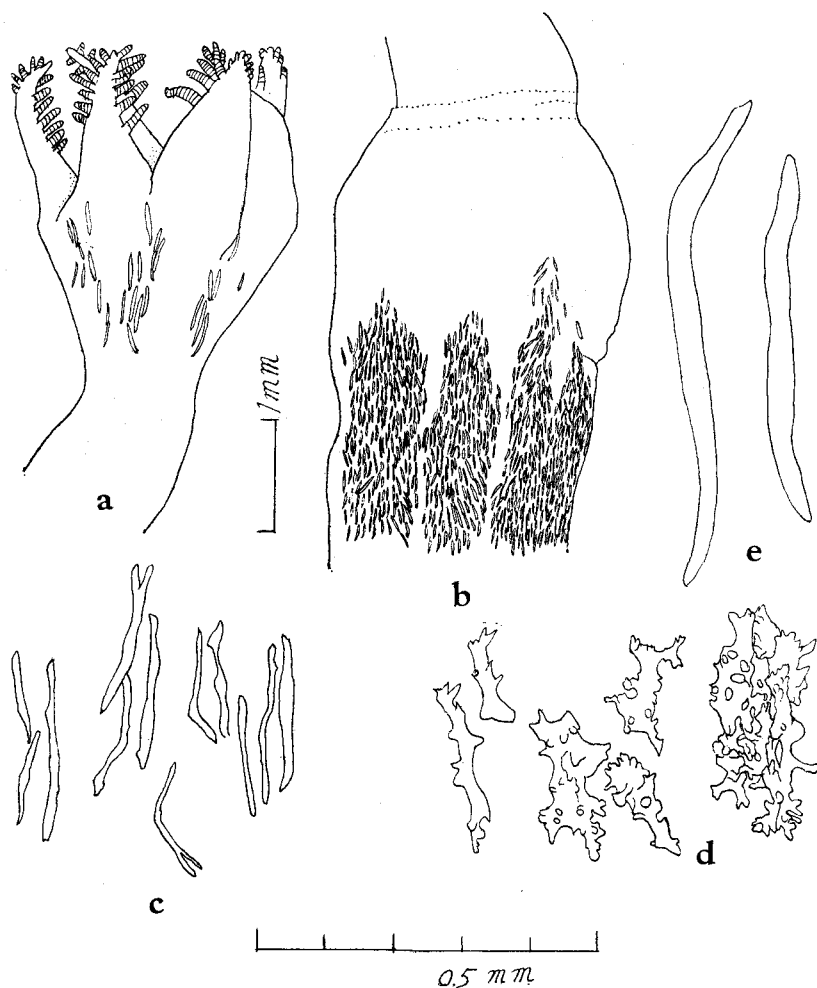
Etymology. The species name here proposed is derived from the local name of the Inland Sea of Japan ('Setouti' or 'Seto-Naikai' in Japanese), where this new telestid occurs commonly.

Diagnosis. Densely arborescent *Telesto* with body walls longitudinally grooved and moderately thickened; lateral polyps very frequently branching in high orders; anthostelar spicules consisting of two forms, small branching spinose rodlets often partially fused, lying interseptally and longer slender needles lying septally; anthocodial armature weak, only in eight longitudinal rows septally and lacking on tentacles; pinnules moniliform; color in life peach red or Vandyke red, in alcohol dull orange.

Description. Colonies arising from reticulating stolons are densely arborescent,

the primary axial polyps extend up to 30 mm in total length, and give rise to secondary polyps about 3–20 mm long on all sides. Highly developed secondary polyps are nearly as long as the primary polyp and further issue tertiary ones (Plate I, fig. 3). These daughter polyps are generally 7–8 mm tall and 1.5 mm wide distally.

On the same stem or branches, they are arranged 2–5 mm apart in pairs



Text-fig. 1. *Telesto setoutiana* UTINOMI, sp. nov.

a, Moderately expanded polyp of the holotype from Kannonbana, Mukai-sima, showing the septal arrangement of anthocodial spicules; *b*, distal part of body wall of the same specimen, showing the interseptal arrangement of anthostelar spicules on the periphery of longitudinal ribs; *c*, anthocodial spicules; *d*, non-fusing spicules (5 on the left) and partially fusing spicules (on the right) of the body wall; *e*, septal spicules lying in deeper layer of the longitudinal grooves of the body wall.

(Enlargement of *a* and *b* indicated by adjacent 1 mm scale; that of *c-e* by 0.5 mm scale at the bottom.)

or alternately.

The body walls are generally thickened, rigid in texture and overgrown by minute encrusting hydroids such as *Halecium flexile* ALLMAN, *Eudendrium biserialle* FRASER, *Tubularia* sp., etc. and white encrusting sponges (?*Prosuberites*). The eight narrow longitudinal grooves on the body walls run continually from the base of the polyps up to the distal ends of axial and subordinate polyps.

The anthocodiae are transparent and tentacles, when fully extended, are about 1.5 mm long and bear 10 pairs of about 0.12–0.25 mm long, moniliform pinnules in the distal half. The rachis of tentacles lacks spicules, but a few rodlets are longitudinally arranged in eight rows along the septa between the bases of tentacles; these anthocodial spicules are slightly curved and often divergent at both ends, measuring 0.1–0.23 mm long and 0.014 mm wide (Fig. 1, *a* and *c*). The pinnules and neck portion are apparently devoid of spicules.

Anthostelar spicules in the body walls consist of two kinds: (1) spinose rodlets, 0.09–0.23 mm long and 0.02–0.04 mm wide, with numerous branching processes by which they often anastomose into groups and partially fused, chiefly occur all over the longitudinal ribs (Fig. 1, *b* and *d*); and (2) long, slender needles about 0.5–0.8 mm long and 0.035 mm wide, occur septally in the stomodeal portion solely in a few number (Fig. 1, *e*). This needle-like spicules lying in deeper layer are about three times as long as the spinose rodlets on the periphery of the interseptal longitudinal ribs, and may correspond to KINOSHITA's "mesenterial spicules" found in *Telesto tubulosa* (KINOSHITA, 1909, p. 115, pl. III, fig. 5).

*Color in life*³⁾ (according to Mr. HOSHINO's field note). Body wall is Vandyke red in well grown forms but peach red in younger forms. Extended tentacles are peach red in either young or well grown forms. In preserved state, however, the body wall is dull orange and tentacles are colorless.

Ecology. This telestid invariably occurs on rocky bottom just beneath the lowest tide level, about 0–1.5 m in depth. According to Dr. A. INABA (personal communication, January 24, 1964), this telestid grows much larger to colonize during the winter season till about April, but decreases during the summer season, and then appears again in the next winter every year, around the Island Mukaisima.

Distribution. As far as could be explored, the distributional range seems to be confined to the central area of the Inland Sea of Japan (better known as 'Setouti' or 'Seto Naikai'), especially around the Island Mukaisima which is designated as the type locality, as far east as the Bisan Strait and further extends southwards to the Island Kasima in Uwa-kai on the eastern side of the Bungo Channel.

Comparison with Related Species

Among the Telestacea, 4 species of *Telesto*, 2 species of *Paratelesto* and 1 species

3) Refer to WADA, S. (ed.) 1935. *Sikimei Sokan* [Color standards and nomenclature]. Tokyo.

of *Pseudocladochonus* are hitherto known from the Japanese waters. They are:

- Telesto tubulosa* KINOSHITA, 1909 クダコエダ (内海)
T. sagamina KINOSHITA, 1909 サガミコエダ (新称)
T. trichostemma (DANA, 1846) ヤワコエダ (新称)
T. arborea WRIGHT and STUDER, 1889 ナガコエダ (新称)
Paratelesto rosea (KINOSHITA, 1909) UTINOMI, 1958 ベニコエダ (内海)
P. kinoshitai UTINOMI, 1958 キノシタベニコエダ (内海)
Pseudocladochonus hicksoni VERSLUYS, 1908 ハナノエダ (駒井)

Most of these telestids are known from deep waters down to 200 fathoms, except only *Telesto trichostemma* (cf. LAACKMANN, 1909; KÜKENTHAL, 1913). Other Indo-Pacific shallow-water species are *Telesto smithi* (GRAY, 1869) known from Australia and Formosa Strait and *T. prolifera* (v. KOCH, 1882) from the Indo-Malayan waters (cf. LAACKMANN, 1909; SHANN, 1912; RIDLEY, 1884; UTINOMI, 1972).

The present species seems to be allied very closely to a West Atlantic species *Telesto riisei* (DUCHASSAING et MICHELOTTI, 1860) (= *T. rupicola* F. MÜLLER, 1867), which is known from Florida to Brazil at the low tide level down to about 30 fathoms (cf. DEICHMANN, 1936; BAYER, 1959, 1961) in densely arborescent growth and weak spiculation of anthocodiae, but can be easily distinguished from it in lacking spicules on the tentacle-backs and bearing a few large needle-like spicules in deep layer placing lengthwise along the longitudinal grooves of the body wall.

Of the other Japanese species, *Telesto tubulosa* and *T. sagamina*, both living in deeper waters, do not show such profuse branching, bearing only uniformly short cylindrical lateral polyps in a pinnate manner, and the body wall spicules are rather more tuberculous to grow as 'capstan-like' (KINOSHITA, 1909; UTINOMI, 1958).

As formerly discussed, *Clavularia japonica* NUTTING (1912) recorded from various deep-water stations of the U. S. Fisheries Steamer "Albatross" during 1906 Cruise in Japanese waters is a synonym of *Telesto tubulosa* mentioned above (UTINOMI, 1958, p. 93).

Nomenclatural Review of the Telestacean Octocorals

Among the representatives of the Telestacean octocorals, *Telesto* LAMOUROUX, 1812 (= *Telesco* GRAY, 1869; *Carijoa* F. MÜLLER, 1867) had been ranked in the stoloniferan family Clavulariidae DANA in earlier decades (cf. DANA, 1846; VERRILL, 1869; KOCH, 1887; STUDER, 1887; WRIGHT and STUDER, 1889). After the establishment of a special family Telestidae (*pro* Telestinae of the family Alcyonidae) by MILNE EDWARDS et HAIME (1850, 1857), it was transferred to that family by most of the later authors along with *Pseudogorgia* KÖLLIKER, *Coelogorgia* MILNE EDWARDS et HAIME and *Scleranthelia* STUDER (cf. RIDLEY, 1884; MAY, 1900; HICKSON and HILES, 1900⁴⁾; HICKSON, 1903; LAACKMANN, 1909; KINOSHITA, 1909; KÜKENTHAL, 1911; KÜKENTHAL, 1913, etc.).

(For note 4, see the foot on next page)

In recent years, MOLANDER (1929) much emended the diagnosis of *Clavularia*, reckoning to the Telestidae. HICKSON (1930), however, opposed to his conclusion and newly established a separate order Telestacea for a single family Telestidae MILNE EDWARDS et HAIME, comprising three genera, i.e. *Telesto*, *Coelogorgia*, *Pseudogorgia* and *Pseudocladochonus*.

For the last-mentioned *Pseudocladochonus* alone, MADSEN (1944) erected a family Pseudocladochonidae and a new genus *Telestula* for the type species *T. septentrionalis* and some relatives which had been referred to *Pseudocladochonus* by THOMSON and DEAN (1931). Afterwards, BAYER (1952) transferred 2 species of *Clavularia* recorded by NUTTING (1908) from the Hawaiian Islands to this *Telestula* and suggested *Telesto ambigua* NUTTING (1909) from off Monterey Bay, California, 524 fathoms as a member of *Telestula*.

KÜKENTHAL (1913), who re-examined Californian alcyonarians ever studied by NUTTING (1909), regarded NUTTING's '*Telesto rigida* WR. and ST.' as a new species of *Telesto* and named it *Telesto californica*, and added another new species *Telesto nuttingi* from South Californian coast, 40 fathoms.

Presumably, the former *T. californica* may also be a member of *Telestula* near *Telestula spiculicola* (NUTTING) BAYER from the Hawaiian waters, although its internal structure, especially regarding the lower part of the axial polyps is not well defined. The latter *T. nuttingi* KÜKENTHAL from China Point, Southern California, 48 fathoms may be rightly an ordinary *Telesto*, since it occurs on relatively shallower bottom and its body wall is overgrown with sponges, hydroids and bryozoans, as usual in most of *Telesto*-species.

As regards another representative, *Coelogorgia palmosa* MILNE EDWARDS et HAIME, 1857, WRIGHT and STUDER (1889) exhaustively described and illustrated its morphological details, but they assigned to the Clavulariidae DANA. Since the establishment of the Telestidae (pro Telestinae) by MILNE EDWARDS et HAIME (1850-54, lxxvii; 1857, I, p. 112) as a subfamily of the family Alcyoniidae for a genus *Telesto* (pro *Telestho*), *Coelogorgia* too has been grouped in the Telestidae rather tentatively (cf. e. g., RIDLEY, 1884; MAY, 1900; VERSLUYS, 1907; KINOSHITA, 1909; KÜKENTHAL, 1911; BAYER, 1956; TIXIER-DURIVAUT, 1966; VERSEVELDT, 1971).

It seems, however, that MILNE EDWARDS et HAIME (1857, p. 191) themselves had considered it as a member of Briareid gorgonaceans. BOURNE (1900, p. 30) erected a special family Coelogorgiidae under the name Stelecotokea for *Coelogorgia* alone, separating from the Telestidae. This family was later used by THOMSON and HENDERSON (1906, p. 435) and followed by HICKSON (1909, p. 349), ranking within the Alcyonacea.

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- 4) Of two telestids, described and figured in this paper, '*Telesto rupicola*' may not be the true *T. rupicola* which is a synonym of *T. riisei* (DUCHASSAING et MICHELOTTI), an Atlantic species, but may be referred to *T. prolifera* (VON KOCH, 1882, 1887). On the other hand, '*T. arthuri* n. sp.' may be a siphonogorgiid (near *S. cylindrata* KÜKENTHAL, 1911), as already suggested by VERSLUYS, 1907, p. 15.

In establishing a new order Telestacea for *Telesto* and its allies, however, HICKSON (1930) adopted only the Telestidae as a representative family name and discarded the Coelogorgiidae of BOURNE. He further ranked together four heterogenous genera, such as *Telesto*, *Coelogorgia*, *Pseudocladochonus* and *Pseudogorgia* into the family Telestidae. The last-mentioned *Pseudogorgia*, however, should be excluded from this order on account of its unbranched large-sized colony formation relating to the other order Gorgonacea. Concerning this less-known unique genus, another paper will be devoted (UTINOMI and HARADA, 1973).

The interrelation between the remaining genera formerly reckoned to the Telestidae may be practically conceivable by dividing it into smaller groups as familial rank rather than merging within the oldest family Telestidae which is equivalent to the order Telestacea in view of their evolutionary trend.

Emended Classification of the Order Telestacea

1. Family Telestidae MILNE EDWARDS & HAIME, 1857 (restricted) コエダ科

Emended diagnosis.—Monopodial colonies arising from an encrusting stolon either branching or membranous, with a tall axial polyp and shorter lateral polyps of subordinate rank. Branching not much frequent. Gastrovascular cavity of axial polyp broad and surrounded by a ring of mesogloeoal canals in its wall; lower part of axial gastrovascular cavity open to base or filled with spiculiferous mesogloeoal tissues. Body wall thin or moderately thick, with 8 distinct longitudinal grooves on external surface. Living in shallow or deep waters.

Genera included.—*Telesto* LAMOUROUX, 1812 [Type: *T. aurantiaca* LAMARCK] コエダ属
Telestula MADSEN, 1944 [Type: *T. septentrionalis* MADSEN]

コエダモドキ属 (新称)

2. Family Coelogorgiidae BOURNE, 1900 ハネコエダ科 (新称)

Emended diagnosis.—Monopodial, much arborescent colonies arising from less-branched stolons, with tall axial polyps and lateral polyps of subordinate rank borne either on two sides or in spirals from axial stem formed of thickened walls of axial and secondary polyps which are perforated by many mesogloeoal canals concentrically arranged around narrowed axial gastrovascular cavities open to base of polyps. Body wall thick, much spiculiferous, with 8 longitudinal grooves on external surface. Branching plumose or flabellate. Living mostly in upper subtidal or shallow waters.

Genera included.—*Coelogorgia* MILNE EDWARDS et HAIME, 1857 [Type: *C. palmosa* M. EDW. & H.] ハネコエダ属 (新称)

Paratelesto UTINOMI, 1958 [Type: *Telesto rosea* KINOSHITA, 1909]

ベニコエダ属 (内海)

3. Family Pseudocladochonidae MADSEN, 1944 ハナノエダ科 (駒井)

Emended diagnosis.—Sympodial colonies (about equal polyps arising from near tip of

each polyp succesively in a form of zigzag manner). Each polyp slender, partially filled with spiculiferous mesogloal tissues which leave open 8 longitudinal canals. Body wall thin, with 8 indistinct longitudinal grooves on external surface. Living in deep waters. (Mostly after BAYER, 1956).

Genus included.—*Pseudocladochonus* VERSLUYS, 1907 [Type: *P. hicksoni* VERSLUYS]

ハナノエダ属(駒井)

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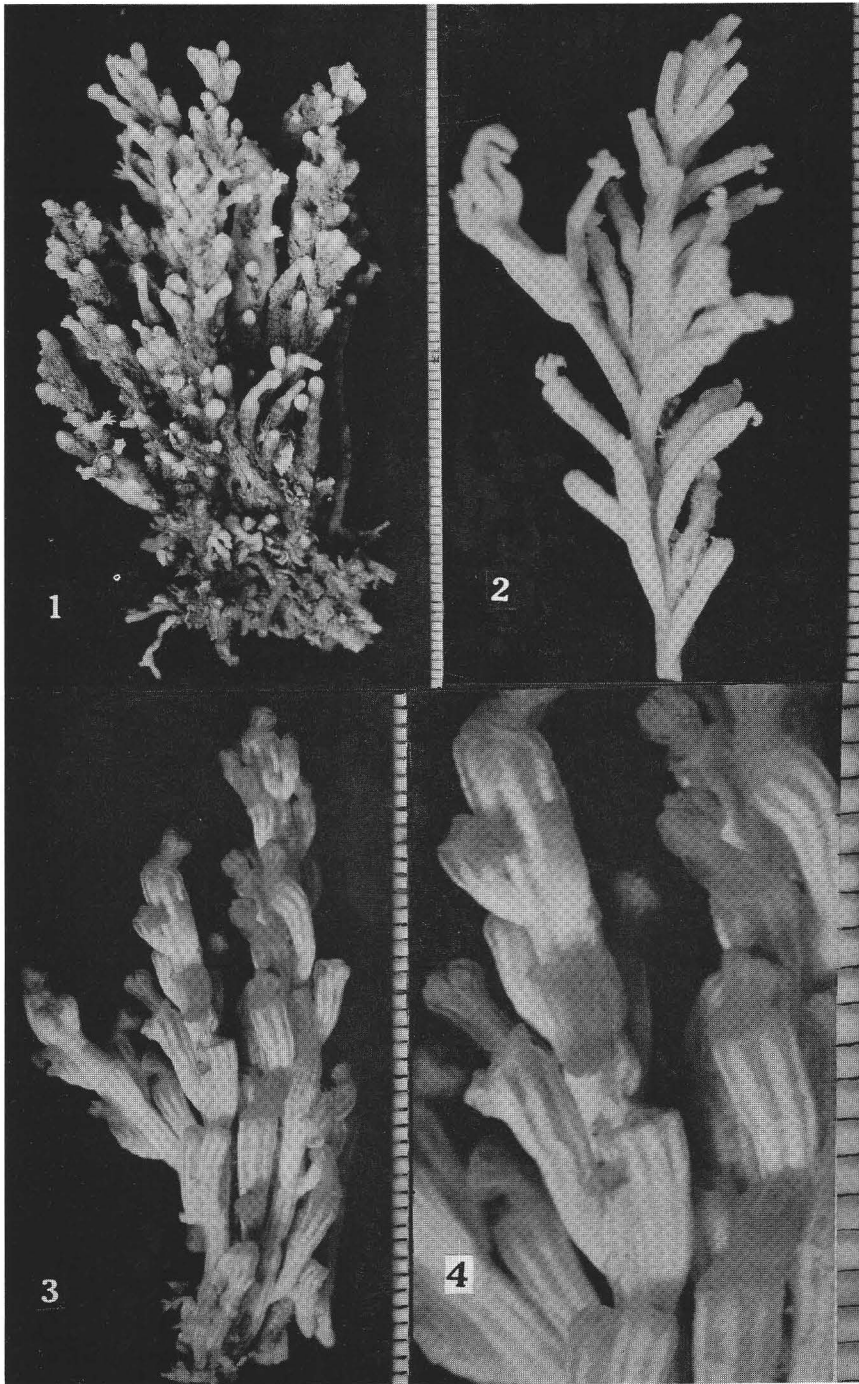
EXPLANATION OF PLATE I

Telesto setoutiana UTINOMI, sp. nov.

- Fig. 1. Holotype from Kannonbana, Mukai-sima, Hirosima-Ken (SMBL Type 238). $\times 1.5$
- Fig. 2. Paratype D from Onomiti Pier, Hirosima-Ken, showing profuse branching of daughter polyps in fully grown colony. $\times 2.5$
- Fig. 3. Paratype F from Kozuti-zima, Kagawa-Ken, showing partially extended anthocodiae. $\times 3$
- Fig. 4. Part of the same specimen, particularly showing the septal arrangement of anthocodial spicules and spiculiferous broad longitudinal ribs in the anthosteles. $\times 7$

Magnifications apply to mm scales as indicated on the right side of each figure.

(Photo: Dr. Sh. FUSE)



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